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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/627,891	07/28/2003	Genji Imai	029430-553	3805

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EXAMINER

HAMILTON, CYNTHIA

ART UNIT PAPER NUMBER

1752

DATE MAILED: 09/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/627,891

Applicant(s)

IMAI ET AL.

Examiner

Cynthia Hamilton

Art Unit

1752

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 28 July 2003.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 24-44 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 24-44 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☒ Certified copies of the priority documents have been received in Application No. 09418368.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 28 July 2003.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 30 and 37 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claim 30, formula (5) is defined twice as is  $R^3$  and in the two lines just after the first formula (5) "in which the total or branched unsubstituted alkyl or  $C_1-C_6$  straight or branched alkyl" makes no sense. The same problem is found in claim 37. Thus, the limits of formula (5) are confusing. Claim 44 does not have this problem.
4. Claims 24-30 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

- a. Claim 24 recites the limitation "said resist composition" in line 4. There is insufficient antecedent basis for this limitation in the claim. There is in line 1 of claim 24 a "resist" but no "resist composition". Thus, claims 24-30 are indefinite.

- b. It is not clear from the language of claims 24-30 whether an irradiated resist, i.e. an imaged resist, is claimed or a resist which has the property of being soluble or dispersible in an organic solvent or an aqueous developing solution when irradiated and when not irradiated. Is the resist made from "said resist composition" or is the resist the

Art Unit: 1752

“said resist composition”? This issue is not clear when considering the specification as a whole. The “said resist composition” is not disclosed as becoming soluble or dispersible upon irradiation. What is disclosed in the specification is the “said resist composition” after it has been heated becoming soluble or dispersible upon irradiation. The heating step is set forth on page 35 of the instant specification to form a resist. In heating, the unsaturated ether group is consumed, as are some if not all of the carboxyl groups in the copolymer. It is this heating step that causes a resist to be formed that is insoluble in a solvent or aqueous alkali solution. Thus, the “resist” of line 1 in claim 24 does not appear to be “said resist composition” but instead a product made from “said resist composition”. Thus, what is being claimed is unclear.

5. Claims 31-37 and 38-44 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is not clear from the language of claims 31-37 whether an irradiated resist, i.e. an imaged resist, is claimed or a resist which has the property of being soluble or dispersible in an organic solvent or an aqueous developing solution when irradiated. Further, it is not clear where support for said resist of claim 31-37 is found in the original specification because the only positive thermally sensitive resist which have these properties is that which is made from the “said resist” of claims 31-37. The composition set forth is not that on page 35 of the instant specification which is the actual resist that has the properties of an irradiated resist, i.e. an imaged resist, is claimed or a resist which has the property of being soluble or dispersible in an organic solvent or an aqueous developing solution when irradiated. The heating step is set forth on page 35 of the instant specification to form a resist. In heating,

the unsaturated ether group is consumed, as are some if not all of the carboxyl groups in the copolymer. It is this heating step that causes a resist to be formed that is insoluble in a solvent or aqueous alkali solution. Thus, what is being claimed as a “positive thermally sensitive resist” in claims 31-37 is confusing. The same problem is present in claims 38-44 with respect to “the positive visible-light sensitive resist” and the “said resist comprising”. Thus, what is being claimed in claims 31-44 is unclear.

6. Claims 24-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Imai et al (5,496,678) in view of Kondo et al (5,363,738), Yamachika et al (5,556,734) and Hanabata et al (4,696,886). Imai et al teach all the instant invention with the exception of using hydroxystyrene instead of alpha methyl hydroxystyrene, i.e. isopropenylphenol, in their polymers and, with respect to instant claims 24-30, referencing their compositions as “positive ultraviolet sensitive resists”, with respect to instant claims 31-37, referencing their compositions as “positive thermally sensitive resist”, and with respect to instant claims 38-44, referencing their compositions as “positive visible-light sensitive resist”. In Imai et al, see particularly Synthesis Example 2 and Example 2. Imai et al is broad in disclosing polymers with having carboxyl groups and hydroxyphenol groups as a choice for (A) as set forth in the Abstract. Kondo et al in col. 19, lines 42-68, disclose these choices of phenolic monomer as equivalent in similar systems. Applicants disclose the use of the alpha methyl hydroxystyrene yields a polymer of superior to that of the non alpha form. Yamachika et al teach the use of the alpha methyl form of the hydroxystyrene in chemically amplified resists yields an image excellent in resolution and pattern profile over the non alpha methyl resist. Hanabata et al, in col. 4. Lines 11-63, teach a tougher film being formed with the alpha-methyl hydroxystyrene being used. Thus, with respect

Art Unit: 1752

to instant claims 24-44, the use of the alpha-methyl styrene monomer to make the polymer used in either Kondo et al or Imai et al would have been prima facie obvious to obtain a structurally more preferred resist pattern. Applicant's showings of non working photoresists in their specification are not comparisons with the closest prior art processes. The compositions as claimed are prima facie obvious over the art for use in the processes of Imai et al and Kondo et al.

7. The examiner notes that applicants have not filed the 37 CFR 1.132 declaration in this application put forth in the parent application which overcame the above prior art rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cynthia Hamilton whose telephone number is 571-272-1331.

The examiner can normally be reached on Monday through Friday 9:30 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia H Kelly can be reached on (571) 272-0729. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Cynthia Hamilton  
Primary Examiner  
Art Unit 1752

September 3, 2004

**CYNTHIA HAMILTON**  
**PRIMARY EXAMINER**